AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application:

LISTING OF CLAIMS:

1. (currently amended): A torsional vibration suppressing control method in an electric motor speed control system constituted by a mechanism for transmitting a driving torque from an electric motor to a load through a driving shaft which is provided on the load side of the electric motor and has a low torsional rigidity, and a control device for feeding back an electric motor mean speed N_{MAVG} obtained by a calculation for a mean value every constant cycle for an electric motor speed detection signal detected by a speed detector for a speed command N_{REF} and calculating a deviation signal, and controlling a current of the electric motor in order to have an electric motor torque in accordance with a torque command signal T_{RFA} obtained by amplifying the deviation signal by means of a speed controller having a proportional gain and an integrator or only the proportional gain,

wherein a signal obtained by multiplying a signal acquired by differentiating the electric motor mean speed signal N_{MAVG} by an inertia time constant τ_M of the electric motor portion is input as an electric motor acceleration torque signal T_{MAFB} to an inertia controller with respect to the torque command signal T_{RFA} output from the speed controller, and

the inertia controller multiplies the electric motor acceleration torque T_{MAFB} by the proportional gain and then outputs a value thus obtained as an inertia control signal T_{MJC} through a second-order or first-order low-pass filter and a second-order or first-order high-pass filter,

feeds back the electric motor acceleration torque signal T_{MAFB} to an electric motor acceleration torque command T_{RFAX} obtained by decreasing the inertia control signal T_{MJC} from the torque command signal T_{RFA} output from the speed controller, and controls a current of the electric motor in order to have an electric motor torque in accordance with a signal T_{RFM} obtained by adding, to the acceleration torque command T_{RFAX}, a torque compensation signal T_{RFL} acquired by amplifying a signal of a deviation thereof by means of an electric motor acceleration torque controller constituted by the proportional gain and the integrator, thereby carrying out a control in order to cancel an electric motor load torque in response to the torque compensation signal T_{RFL} calculated and output in such a manner that ~~the torque command signal T_{RFA} output from the speed controller~~the electric motor acceleration torque command T_{RFAX} and the electric motor acceleration torque feedback signal T_{MAFB} are coincident with each other and equivalently enlarging and controlling an inertia of the electric motor portion.

2. (original): The torsional vibration suppressing method in an electric motor speed control system according to claim 1, wherein a proportional gain of the inertia controller is set to have a negative value of 0 to -1, thereby equivalently reducing and controlling the inertia of the electric motor portion.

3. (currently amended): An electric motor control apparatus constituted by speed detecting means for detecting an electric motor speed, a mechanism for transmitting a driving torque from an electric motor to a load through a driving shaft which is provided on the load side

of the electric motor and has a low torsional rigidity, and a control device for feeding back an electric motor mean speed N_{MAVG} obtained by a calculation for a mean value every constant cycle for an electric motor speed detection signal detected by a speed detector for a speed command N_{REF} and calculating a deviation signal, and controlling a current of the electric motor in order to have an electric motor torque in accordance with a torque command signal T_{RFA} obtained by amplifying the deviation signal by speed control means having a proportional gain and an integrator or only the proportional gain, comprising:

inertia control means for calculating and outputting an inertia control signal T_{MJC} by an inertia controller from an electric motor acceleration torque signal T_{MAFB} obtained by multiplying a signal acquired by differentiating the electric motor mean speed signal N_{MAVG} by an inertia time constant τ_M of the electric motor portion;

electric motor acceleration torque control means having a proportional gain and an integrator for calculating a torque command compensation signal T_{RFL} from a deviation signal of a signal T_{RFAX} obtained by decreasing the electric motor inertia control signal T_{MJC} from the torque command signal T_{RFA} to be an output signal of the speed control means and the electric motor acceleration torque signal T_{MAFB}; and

electric motor torque control means for controlling a current of the electric motor in order to obtain an electric motor torque in accordance with a torque command T_{RFM} to be a sum of ~~the torque command signal T_{RFA} to be an output signal of the speed control means~~the electric motor acceleration torque command T_{RFAX} and the torque command compensation signal T_{RFL} to be an output signal of the electric motor acceleration torque control means.